



Docket No.: M4065.0101/P101
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Howard E. Rhodes

Application No.: 09/172,298

Confirmation No.: 9094

Filed: October 14, 1998

Art Unit: 2811

For: CMOS IMAGER HAVING A NITRIDE
DIELECTRIC

Examiner: G. M. Munson

APPELLANT'S REPLY BRIEF

MS Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

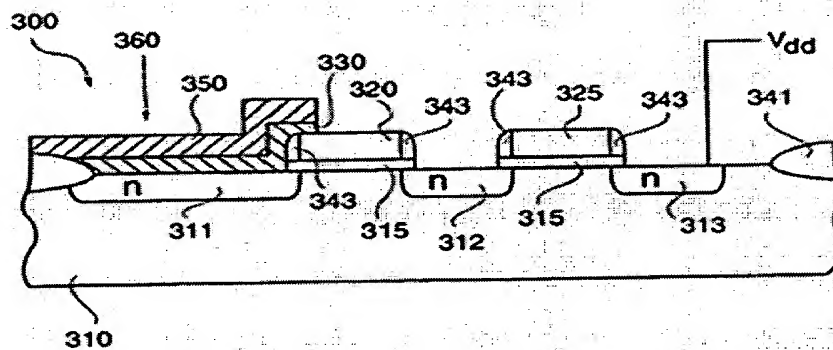
Dear Sir:

This Reply Brief is filed pursuant to 37 C.F.R. §41.41 and is responsive to the Examiner's Answer mailed July 28, 2005 in connection with the Appellant's appeal from the final rejection of claims 1-4, 7-15, 18-23, 25-29, 31-39, 41-63, 65, and 115-144 mailed August 18, 2004 for the above-identified U.S. Patent Application. A Request for Oral Hearing is also being submitted herewith.

The Examiner's Answer and the final rejection of claims 1-4, 7-13, and 120 are based on the assertion that U.S. Patent No. 5,804,845 ("Anagnostopoulos") anticipates every element of the claimed invention. Reproduced below for the convenience of the Board is independent claim 1 including parenthetical numeric reference to elements shown in FIG. 10 of the Application, which shows an exemplary embodiment of part of the invention. Independent claim 1 recites:

An imaging device comprising: a substrate (310); a photosensitive area within said substrate for accumulating photo-generated charge in said area (311); a photogate (360) for controlling the accumulation of photo-generated charge in said photosensitive area; a first and a second gate stack; a first insulating layer in contact with said substrate and beneath each of said first and second gate stacks (315); and a nitrogen containing second insulating layer (330) distinct from said first insulating layer (315), said second insulating layer being in contact with said substrate and being located beneath said photogate.

FIG. 10



Turning to the teaching of Anagnostopoulos, FIG. 3A from the Anagnostopoulos patent is reproduced for the Board's convenience on the next page, and the numeric references in the following discussion relate to the elements shown in that Figure.

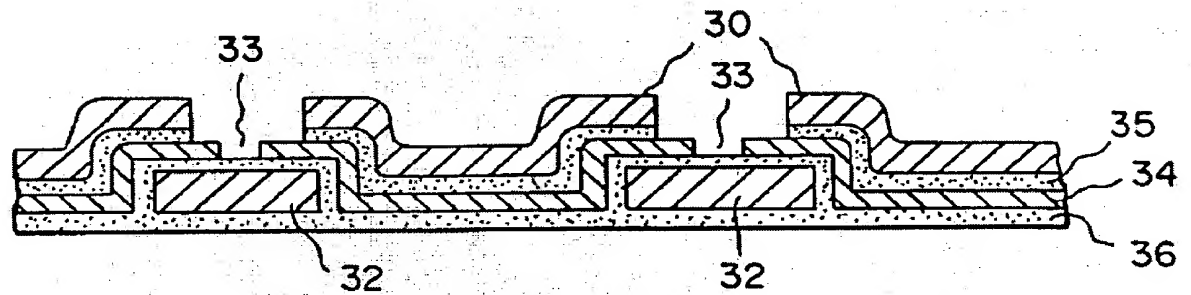


FIG. 3A

The Examiner's reply continues to argue that, in Anagnostopoulos, the admitted "sublayers" (top oxide layer 35, nitride layer 34, and bottom oxide layer 36) of the ONO layer can satisfy the claims limitations of a "first insulating layer in contact with said substrate and beneath each of said first and second gate stacks," and "a nitrogen containing second insulating layer distinct from said first insulating layer, said second insulating layer being in contact with said substrate and being located beneath said photogate." Even assuming, *arguendo*, that the sublayers 35, 34, 36 taught by Anagnostopoulos are "distinct," as required by the claims, only the bottom oxide sublayer 36 is "in contact with [the] substrate," which is required of both the first and second insulating layers in the claims that stand rejected.

Further, Appellant respectfully disagrees that the sublayers that the Examiner refers to are "distinct" as required by the claim. Specifically, the Examiner's analogy relating the Anagnostopoulos "sublayers" to Alexandria and Arlington cities is misguided. With reference to either the embodiment shown above in FIG. 3A or in the embodiment shown below in FIG. 3C, the Examiner points out the layers within the ONO (35, 34, 36) or NO (51, 52) layer as teaching the claimed first and second insulating layers. The Examiner, however, is not pointing to two distinct sublayers within either the ONO or NO layer when making his analogy. For example, the Examiner is not relying on the bottom oxide layer (36 or 52) alone as the claimed "first insulating layer" and the nitride layer (34

or 51) as the claimed “second insulating layer,” because if this were the argument, the nitride layer (34 or 52) is not “in contact with [the] substrate” as required by each of the claims. Rather, the Examiner’s rejection is based on the bottom oxide layer (36 or 52) as satisfying the “first insulating layer,” and an NO layer (which includes the bottom oxide layer 36 or 52 as well as the nitride layer 34 or 51) as satisfying the “second insulating layer.” As such, the two layers are not “distinct.” The more appropriate analogy is that Arlington and Arlington County are both subportions of Virginia, but they are not distinct geographic regions because one (Arlington) is a subportion, fully included within the other (Arlington County).

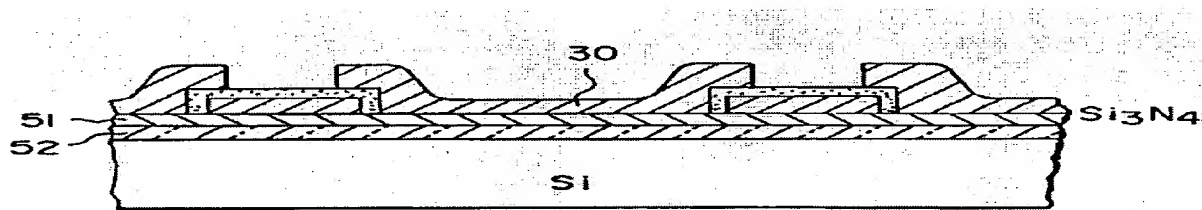


FIG. 3C PRIOR ART

For at least these reasons, Anagnostopoulos does not teach or suggest every claim limitation recited by each of the rejected claims. Appellant respectfully submits that Anagnostopoulos does not anticipate the claimed invention. Reversal of the final rejection of claims 1-4, 7-13, and 120 is requested.

The Examiner’s Answer and the final rejection of claims 1, 3, 7, 14, 15, 18, 19, 26, 28, 29, 31-33, 38, 39, 41, 42, 44, 46, 51, 53, 55, 57-59, 115-125 and 135-139 are based on the assertion that one of ordinary skill in the art would have combined the acknowledged prior art with the teachings of U.S. Patent No. 5,307,169 (“Nagasaki”) to arrive at the claimed invention.

Appellant agrees with the Examiner that the correct standard in determining obviousness is whether a “person of ordinary skill in the relevant art, familiar with all that the acknowledged prior art and Nagasaki et al disclose, ‘would have found it obvious to

make a structure corresponding to what is claimed.” Examiner’s Answer, at 9. However, Appellant disagrees with the Examiner’s result, which Appellant believes is ignoring the explicit teaching away of Nagasaki from using nitrogen-containing compounds, and is improperly using hindsight reasoning to combine the references as to arrive at the claimed invention. M.P.E.P. § 2145.

Courts have generally recognized that a showing of a *prima facie* case of obviousness necessitates three requirements: (i) some suggestion or motivation, either in the references themselves or in the knowledge of a person of ordinary skill in the art, to modify the reference or combine the reference teachings; (ii) a reasonable expectation of success; and (iii) the prior art references must teach or suggest all claim limitations. See e.g., *In re Dembiczak*, 175 F.3d 994 (Fed. Cir. 1999); *In re Rouffet*, 149 F.3d 1350, 1355 (Fed. Cir. 1998); *Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc.*, 75 F.3d 1568, 1573 (Fed. Cir. 1996). Appellant respectfully submits that the present rejection does not establish a *prima facie* case of obviousness of the claimed invention because the cited prior art does not teach or suggest all of the claim limitations, nor is there an objective suggestion or motivation to combine the reference teachings as suggested by the Examiner.

Neither the acknowledged prior art nor Nagasaki teach or suggest “a nitrogen containing second insulating layer [that is] distinct from said first insulating layer,” and that is beneath at least a portion of the photosensor and in contact with the substrate. The Examiner is mischaracterizing the disclosure of Nagasaki as teaching use of “an insulator with a higher dielectric constant” (Examiner’s Answer, at 10 [Emphasis Added]). Rather, Nagasaki actually teaches use of materials deemed “high” dielectric materials. Col. 3, lines 20-29 (stating “a dielectric substance having relative dielectric constant of 20 or less is termed a low dielectric material, and a dielectric substance having relative dielectric constant 20 or more a high dielectric material.”) Nagasaki only teaches use of these “high” dielectric materials (of which he provides several examples), to replace silicon dioxide as an insulating material. See Table 1, and the accompanying text, including Col.

3, lines 20-29; Col. 2, lines 17-25. The only nitrogen-containing material discussed by Nagasaki is silicon nitride, which Nagasaki teaches has a relative dielectric constant equal to 10, and is therefore a “low” dielectric material. Therefore, Nagasaki provides no teaching or suggestion of the claimed “nitrogen containing second insulating layer.” Moreover, the acknowledged prior art relied on for this rejection discusses silicon dioxide as the insulating layer, and also does not teach or suggest using a nitrogen-based dielectric. Thus, the references, whether considered alone or in combination, do not teach or suggest every limitation of the claims.

Second, the Examiner has not cited any objective suggestion or motivation to combine the reference teachings as to arrive at the claimed invention. Only by relying on the teachings in the present invention would one of ordinary skill in the art combine Nagasaki with the acknowledged prior art to arrive at the claimed invention. To the extent that Nagasaki teaches or suggests modification of the acknowledged prior art, it is only to replace the silicon dioxide layer with a “high” dielectric material, such as the ferroelectric and antiferroelectric substances named by Nagasaki. As stated above, Nagasaki discusses only one nitrogen-containing substance, which he deems a “low dielectric material,” and therefore not suitable for the modification described above. (See Table 1). Accordingly, Nagasaki teaches away from the combination that the Examiner is trying to make, and therefore, there is no objective motivation to make the combination suggested by the Examiner.

For at least these reasons, Appellant respectfully submits that the references of record do not establish *prima facie* obviousness. Reversal of the final rejection of claims 1, 3, 7, 14, 15, 18, 19, 26, 28, 29, 31-33, 38, 39, 41, 42, 44, 46, 51, 53, 55, 57-59, 115-125 and 135-139 is requested.


Each of the remaining rejections is based on the references discussed above, and Appellant submits that no other references of record cure the deficiencies of these references as described herein. Accordingly, Appellant would direct the Board’s attention to the arguments put forth in Appellant’s original Brief which specifically addressed each of

the remaining rejections. In addition, the Examiner states that the Appellant is attempting to overcome the outstanding rejections by arguing the individual teachings of the references. (See Examiner's Answer at 11). Appellant disagrees with the Examiner's argument and would point out that where references have been distinguished individually in the Appellant's Brief, that this is done only to establish that the reference does not teach or suggest the claim limitations for which the Examiner's rejection relies on the reference as teaching.

The rejections of claims 1-4, 7-15, 18-23, 25-29, 31-39, 41-63, 65, and 115-144 should be reversed, for the reasons given in the Appellant's Brief, and for the additional reasons set forth herein.

Dated: September 28, 2005

Respectfully submitted,



By _____

Thomas J. D'Amico

Registration No.: 28,371

Megan S. Woodworth

Registration No.: 53,655

DICKSTEIN SHAPIRO MORIN &
OSHINSKY LLP

2101 L Street NW

Washington, DC 20037-1526

(202) 785-9700

Attorneys for Appellant